TITLE: POST-TRAUMATIC STRESS DISORDER AMONG HIV- INFECTED ADULTS ATTENDING AN HIV TREATMENT CLINIC IN POST-CONFLICT GULU DISTRICT, UGANDA.

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ABSTRACT

Background: There is a paucity of research on war trauma and Post Traumatic Stress Disorder (PTSD) among persons living with HIV/AIDS (PLWH) in conflict and post-conflict settings in sub-Saharan Africa. We present, here, findings of a study that investigated the prevalence of PTSD and associated factors among PLWH attending HIV care in post-conflict Gulu district in northern Uganda.

Methods: A sample of 445 persons living with HIV attending care at Gulu regional referral hospital were systematically consecutively recruited and interviewed for this study using standardised assessment instruments that included the Diagnostic and Statistical Manual of Mental Disorders version four (DSM-IV) and the Mini International Neuropsychiatric Interview (M.I.N.I) to assess for PTSD and other comorbid psychiatric disorders. Other assessed variables included socio-demographic characteristics, food insecurity; negative life events, stress scores, war torture experiences, social support and HIV stigma. Data was analysed using SPSS version 20. Frequencies were generated to give the prevalence rate of PTSD and logistic regression was used to assess associations between PTSD and potential risk factors.

Results: The prevalence of PTSD among the HIV infected adults attending for HIV care was 37(8.3%). On war trauma related experiences, 248(56%) reported at least one psychologically traumatic event, 171 (38%) reported at least one physically traumatic event, and 61(14%) reported at least one sexually traumatic event. Factors associated with PTSD in this study population were war trauma experiences, negative life events and the psychiatric disorder of major depression.

Conclusion: There is a considerable burden of PTSD among the adult attendees of the HIV treatment clinic in post-conflict Gulu district in northern Uganda. PTSD in this clinic was associated with both war trauma experiences and negative life events in a dose-response manner. PTSD had a tendency for comorbidity with major depressive disorder. We

recommend inclusion of psycho-trauma treatment services including treatment of PTSD and depression in the treatment programmes of HIV care services in post-conflict communities.

BACKGROUND

Northern Uganda experienced civil war for more than twenty years and it is still experiencing the aftermath of this traumatic exposure. People exposed to trauma face several challenges which include psychological disturbances resulting into mental disorders (1). Post-Traumatic Stress Disorder (PTSD) is among the common trauma related mental disorders (1). Prevalence of PTSD among high risk populations such as child soldiers, former abductees, and Internally Displaced People (IDPs) in Northern Uganda has been reported to range between 35% and 57% (2-6), and 11.8% in northern Uganda general population, several years after the war (7).

The relationship between trauma and its psychological sequelae including PTSD on one hand and HIV on the other is complex and includes bidirectional relationships. On one hand, trauma exposure especially sexual trauma which includes rape and defilement may not only predispose affected individuals to psychological disorders but may directly lead to the acquisition of sexually transmitted infections including HIV (8). It is therefore, not surprising that post-conflict northern Uganda has a higher prevalence of HIV (10.1%) compared to the national rate of 7.3% (9). On the other hand trauma-related psychological disorders such as PTSD may predispose one to risky sexual behaviour which is the greatest risk factor for HIV acquisition in sub-Saharan African settings (10). Community studies on the burden of psychiatric disorders such as PTSD in Uganda have shown that war affected communities on average had twice the burden of psychiatric disorders relative to non-war affected communities (4, 11-14).

Studies among HIV/AIDS populations in South Africa showed high prevalence rates of violence-associated PTSD (14.8%) among communities with high levels of community violence (8). On the other hand, rates of PTSD among HIV/AIDS populations in African societies with low levels of community violence have been reported as 1.6% in Entebbe in central Uganda (15) and 7.1-8.4% in rural Moshi, Tanzania (16).

Post-Traumatic Stress Disorder has not only been associated with impaired quality of life, but also poor HIV/AIDS clinical outcome, poor adherence with medical interventions and high risk sexual behaviour (17-21). Given the critical place PTSD occupies especially in war ravaged communities, this study sought to evaluate the prevalence and factors associated with PTSD among patients living with HIV/AIDS in post-conflict Northern Uganda. To the best of

our knowledge, this is the first study to investigate the burden of PTSD among people living with HIV in a post conflict Ugandan population that was characterised by several traumatic exposures for over 20 years.

METHODOLOGY

Study setting: The HIV clinic at Gulu regional referral hospital offers both in-patient and out-patient care to about 3000 patients. Gulu District is located in the central part of the Northern Region of Uganda and comprises 3 counties, 15 sub-counties and 1 municipal council. It has a population of 374,700 people and it is approximately 335km from Kampala. The HIV clinic offers HIV care to about 200 adults daily and by 2015, about 1744 patients were on Antiretroviral Therapy (ART)(22).

Study design: We conducted a cross-sectional quantitative study at the Gulu regional referral hospital at the HIV clinic among 445 persons living with HIV/AIDS (PLWH). Individuals 18 years and older, registered with the HIV clinic, fluent in English or Acholi (the local language into which the study instruments had be translated), were enrolled into the study. Every 3rd clinic attendee was screened for eligibility into this study. Those respondents found eligible to participate in this study were then consented and interviewed. A non-eligible participant at screening was replaced by the consecutive eligible participant. Individuals who were found to be not so readily responsive (hesitant) to the questions were excluded from the study.

Data collection tools: The dependent variable, Post-Traumatic Stress Disorder (PTSD) was assessed using the Diagnostic and Statistical Manual of Mental Disorders version four (DSM-IV) as referenced by the Mini International Neuropsychiatric Interview (M.I.N.I) (23). M.I.N.I. was also used to assess for the associated psychiatric disorders of major depressive disorder, suicidality, generalised anxiety disorder and alcohol dependence/ misuse. The M.I.N.I has be used by several researchers in Uganda to assess a number of mental disorders (12, 15, 24, 25) and found to be reliable. In addition, the DSM is the diagnostic manual used in Uganda to assess mental disorders in the health sector. Trained psychiatric nurses screened the study participants and interviewed the eligible respondents.

Using a pre-tested questionnaire, data on independent predictors of PTSD was collected. These included:

i). ***Socio-demographic characteristics***: gender, age, marital status, highest educational attainment, religion, and family history.

ii***) Social factors:*** food insecurity (assessed by the question, 'in the last month, did you or your family have enough food?'), duration of awareness of HIV status, negative life events (score index constructed from items of the adverse life events module of the European Para-suicide Interview Schedule) (26). This was previously modified for the Ugandan situation by Kinyanda and colleagues (27). Respondents were asked whether they had experienced each of these events in the last 6 months; 27 items were selected for inclusion in this study based on relevance to the HIV social situation in Uganda. Items were included to reflect the key social relationships in an individual's life, namely parent (5 items), sibling (6 items), spouse/lover (5 items), child(ren) (4 items) and the individual (7 items) with questionnaire items such as 'did your father die?' and 'have you been very ill ? A total score was generated to reflect the total number of negative life events reported.

iii). ***Stress score index:*** This was constructed by scoring each of the reported negative life events on a 3 point Likert scale where respondents were asked the question, 'how stressful did you find the event?' with possible responses being: 0 = (not stressing/minimal stressing), 1 = (moderately stressing), 2 = (severely stressing). A total score was generated where high scores reflected more stress.

iv). ***War torture experiences:*** Respondents were asked about their war trauma experience using items derived from the commonly reported forms of war trauma in Uganda which were 32 items in total (28, 29) grouped under a) loss of loved ones: (5 items)- included death as a result of war of the spouse, children, parents or other close relatives; b) war related sexual torture: (11 items)- including single episode rape, gang rape, homosexual rape, sexual comforting and abduction with sex; c) physical torture: (10 items)-including whether the respondent suffered beatings or being kicked, gunshot injury, burn injuries, being forced to carry heavy loads for long distances and severe tying of the hands behind the back;

v). ***Psychological torture:*** 6 items including whether the respondent witnessed someone being killed, suffered attempted rape, ever been forced to sleep in the bush or swamps for days, weeks and whether ever abducted. All the 32 events were asked in relation to the war experiences.

vi). ***Social support:*** This was assessed using the Multidimensional Scale of Perceived Social Support (MSPSS)(30). The MSPSS is a 12-item instrument that was designed to assess perceptions about support from family, friends and a significant other. Each item on this scale is graded according to a 7 point Likert Scale which for was reduced to 4 for the local situation where: 1= 'strongly disagree'; 2= 'mildly disagree'; 3= 'mildly agree'; 4= 'strongly agree';

vii). ***HIV stigma:*** This was be assessed using the Brief HIV Stigma Scale (31) which focuses on experiences, feelings, and opinions as to how people living with HIV and AIDS (PLWHA) are treated. This instrument has 4 sub-scales including personalised stigma scale (3 items), disclosure subscale (2 items), negative self-image subscale (3 items), and public attitude subscale (2 items) (31). An example of items under personalised stigma is '*I have stopped socializing with some people because of their reactions of my having HIV.'* Items under disclosure subscale were *'I am very careful who I tell that I have HIV'* and '*I worry that people who know I have HIV will tell others'.* An example of items under negative self-image subscale is *'I feel that I am not as good a person as others because I have HIV'*. 'Public attitude subscale had items '*most people think that a person with HIV is disgusting'* and '*most people with HIV are rejected when others find out'.* For all the participants would be asked to choose the most suitable response which would range from strongly agree to strongly disagree.

Data collection procedures: Potential participants were systematically consecutively approached as they were waiting in the triage area of the HIV clinic while waiting to see a health worker. Every 3rd client on the waiting line was invited into a room where there was privacy and the study was explained to them in detail. Those who accepted to participate went through the voluntary consenting process and those who gave voluntary written informed consent were interviewed by trained psychiatric nurses. The interview took approximately one hour for each participant.

Data analysis: Data was analysed using SPSS version 20. The dependant variable in this study was PTSD which was determined using the PTSD algorithm of the M.I.N.I. instrument. Frequencies were used to generate the rate of PTSD in this study. Independent predictors of PTSD that were assessed in this study included socio-demographic characteristics, food security, social support, HIV stigma, traumatic war events, negative life events, stress score index, family history of psychiatric disorder and comorbid psychiatric disorders (major depression, suicidality, generalised anxiety disorder, alcohol dependence/misuse). Logistic regression was used to investigate the association of PTSD with potential predictors. Two

levels of analyses were undertaken, firstly an initial univariate analyses was undertaken where only a given independent variable and PTSD were included in the model (to provide unadjusted Odds ratio). Levels of statistical significance were set at $p \leq 0.05$ for this first level analyses. Associations that were statistically significant at the first level of analysis were then included in the second level logistic regression models that adjusted for age and gender. The level of statistical significance for the second level analyses was set at $p \leq 0.05$.

Ethical Considerations: Written informed consent was obtained from all the study participants before they were interviewed. The objectives and the procedure of the study were explained to the participants and informed voluntary written consents were obtained. Study participants who were found to have significant psychiatric problems were referred to the mental health clinic where they accessed the mental health services at no cost. All data collected were kept under lock and key and only accessible to the research team with no personal identifiers used. This study was approved by Makerere University School of Health Sciences Research and Ethics Committee (SOHSREC NO: 2016-039).

RESULTS

Socio-demographics

Table 1 depicts the socio-demographic characteristics of the sample, with 292 (65.6 %) females, and 153 (34.4 %) male respondents. The majority (87.2%) were aged between 18-40 years. Most (62.0 %) individuals had at least seven years of formal education but with only 22(4.9 %) who had attained tertiary education. Two hundred and thirty-one (51.9%) were married and the majority of the participants were of the Catholic religion.

Table 1: Socio-demographic characteristics of the participants

Variable	Frequency	Percentage
Gender		
Male	153	34.4
Female	292	65.6
Age		

18-30	195	43.5
31-40	150	33.7
41-50	59	13.3
>50	40	09.0
Education level		
No education	61	13.7
Primary	276	62.0
Secondary	86	19.3
Tertiary	22	4.9
Religion[α]		
Protestant	77	17.3
Muslim	09	02.0
Catholic	232	52.1
Pentecostal	22	04.9
SDA	1	0.2
Marital Status∞		
Married	231	51.9
Widowed	74	16.6
Separated	118	26.5
Single	21	4.7

[α]103 participants are missing religion, ∞ one participant is missing marital status

Trauma, negative life events and rate of PTSD

Table 2 shows the war-related traumatic events experienced by the respondents with 248 (56%) reporting at least one psychologically traumatic event, 171 (38%) reported at least one physically traumatic event, and 61(14%) reported at least one sexually traumatic event. The negative life events reported were: 339 (78%) reported at least one personally experienced self-related negative life event, 164 (37%) reported witnessing at least one own child(ren) related negative life event, 155 (35%) reported at least one spouse/partner related negative life event, 120 (27%) reported at least one sibling related negative life event, and 97 (22%) reported at least one parent related negative life event.

Table 2: War related traumatic events and negative life events among respondents

Events	**Frequency (%) 445**
War related	

Psychological trauma	248(56)
Physical trauma	171(38)
Sexual trauma	61(14)
Negative life events related to	
Self	339(76)
Own children	164(37)
Spouse/partner	155(35)
Siblings	120(27)
Parents	97(22)

The table shows multiple experiences and psychological trauma and self-related negative life contributed to the majority of the PTSD cases.

Rate of PTSD and association with socio-demographic and psychosocial risk factors

Table 3 shows the prevalence rate of PTSD in this study population was 37(8.3%). None of the socio-demographic factors, was significantly associated with PTSD (Table 3). The psychosocial factors significantly associated with PTSD included: war trauma experiences, with respondents reporting four or more war trauma related experiences reporting 6.6 times the risk of having PTSD as compared with those who reported three or less war trauma related experiences (aOR=6.6; 95%CI:2-4-18.0; p<0.001); and negative life events, with respondents reporting 6 or more negative life events reporting 3.7 times the risk of developing PTSD as compared with respondents reporting 5 or less negative life events (aOR=3.7; 95%CI:1.4-9.6; p=0.007). The psychosocial factors of social support, HIV stigma, stress scores, and a past history of psychiatric disorders were not significantly associated with PTSD.

Table 3: Rate of PTSD and its association with socio-demographic and psychosocial factors

Variable	**PTSD N(%) 37 (8.3)**	**No PTSD N(%) 408 (91.7)**	**P value**	**OR (95% CI)**	**aOR∞ (95% CI)**	**P value**
Marital Status						
Married	13(35)	218(53)		1	1	
Not married	24(65)	189(47)	**0.035**	2.1(1.1-4.3)	1.8(0.8-4.0)	**0.177**
Social support						
Low	28(76)	222(54)		1	1	
High	09(24)	186(46)	**0.016**	0.4(0.2-0.8)	0.7(0.3-1.8)	**0.461**

HIV Stigma						
Low	12(32)	235(70)		1	1	
High	25(68)	173(30)	**0.004**	2.8(1.4-5.8)	1.7(0.7-4.1)	**0.226**
War Traumatic events						
≤3	11	283		1	1	
≥4	26	125	**<0.001**	5.4(2.6-11.2)	6.6(2.4-18.0)	**<0.001**
Negative life events past 6 months						
≤5	11	302		1	1	
≥6	26	106	**<0.001**	6.7(3.2-14.1)	3.7(1.4-9.6)	**0.007**
Stress level index						
Low(1-10)	03	203		1	1	
High(>10)	31	196	**<0.001**	10.7(3.2-35.6)	1.4(0.3-6.7)	**0.685**

∞ adjusted for age and gender

Clinical factors associated with PTSD

In Table 4, major depressive disorder (MDD) was the only clinical factor significantly associated with PTSD. Respondents with a current MDD episode had 3.3 times the risk of developing PTSD as compared to those without MDD (aOR=3.3; 95% CI: 1.3-10.0; p=0.023). The clinical factors not associated with PTSD were: recent CD4 counts, past psychiatric history, alcohol dependence and suicidality

Table 4: Clinical factors associated with PTSD among HIV + individuals in post conflict northern Uganda

Clinical condition	Number in the study (N, %)	PTSD (N, %)	Unadjusted OR (95%Cl)	P-value	Adjusted OR∞ (95% Cl)	P-value
Recent CD4 count (cells/ЧL)						
≤349	133(40)	18(50)	1		1	
≥350	283(60)	18(50)	2.0 (1.0 -3.3)	**0.042**	0.6 (1.4 – 0.3)	**0.204**

Past Psychiatric History						
No	411(92.4)	18(69.2)	1		1	
Yes	34(7.6)	8(30.8)	5.0 (1.7-10.0)	**0.026**	2.0 (0.7- 5.0)	**0.679**
Major depressive disorder						
Not present	316(73.5)	10(27.0)	1		1	
Present	114(26.5)	27(73.0)	10.0 (5.0- 20.0)	**<0.001**	3.3 (1.3 – 10.0)	**0.023**
Suicidality						
Not present	353(81.7)	14(40.0)	1		1	
Present	79(18.3)	21(60.0)	10.0 (5.0- 10.0)	**<0.001**	3.3 (1.1- 10.0)	**0.368**
Alcohol dependence						
Not present	415(93.3)	7(46.7)	1		1	
Present	30(6.7)	8(53.3)	5.0 (2.0- 10.0)	**0.029**	2.0 (0.4-10.0)	**0.725**

∞ adjusted for age and gender

DISCUSSION

To our knowledge, this is one of the few studies in sub-Saharan Africa that has investigated psychiatric disorders among persons living with HIV/AIDS (PLWH) living in a post-conflict community. Respondents in this study reported very high levels of war trauma, with 56% reporting at least one psychologically traumatic event, 38% reporting at least one physically traumatic event, and 14% reporting at least one sexually traumatic event. Comparable rates of trauma have been reported in South Africa, a country that is known to have high rates of community violence. Olley and colleagues (2005) in a study in the western Cape of South Africa among a sample of PLWH who had recently been diagnosed with PTSD (n=22) reported that in 23% of cases and 14% of cases the 'index traumatic event' was rape and robbery or assault respectively (8).

In this study we found that eight out of every hundred patients interviewed (8.3%) had PTSD. Our finding is very similar to those reported in a community sample from post-conflict northern Uganda where Mugisha and colleagues (2015) reported a prevalence of PTSD of 11.8% (7).

These rates of PTSD were however much higher than those reported among PLWH attending care in the non-war affected Entebbe district in central Uganda (where a rate of PTSD of 1.6% was reported) (15). In South Africa, a country with high rates of community violence high rates of PTSD have been reported among PLWH, with one study from the Western Cape reported a rate of current PTSD of 14.8% and lifetime PTSD of 54% (8). These findings taken together seem to suggest that rates PTSD seen among PLWH are a reflection of the overall burden of PTSD within a given post-conflict community.

The difference in rates of PTSD between the community sample (Mugisha 2015 study) and the persons living with HIV in our sample for this current study (both from northern Uganda) may be due to differences in care. While Mugisha's community sample had no access to regular counselling services, all persons living with HIV in our sample had access to a personal HIV counsellor (7). This may have made the difference in the rates of PTSD between the two samples, with our sample having a slightly lower rate.

In this study we observed that the risk of PTSD increased significantly with increasing numbers of reported war trauma events and negative life events. In the previous community study undertaken in post-conflict Northern Uganda, Mugisha and colleagues (2015) reported similar findings with the risk of developing PTSD increasing with both increasing numbers of reported war traumatic events and negative life events (7). Multiple studies from LMIC have reported similar significant associations between increasing numbers of reported war trauma events and increasing risk of PTSD (3-7, 33-37). A study among Israel soldiers reported a positive association between increasing numbers of war-related negative events and the risk of developing PTSD (38). These findings taken together support the widely documented dose-response effect of war trauma events and negative life events on PTSD pointing to the validity of the PTSD diagnosis in this sub-Saharan African setting as elsewhere (39).

In this study, a current episode of major depressive disorder (MDD) conferred an increased risk of PTSD. Mugisha and colleagues (2015) in a community study in post-conflict northern Uganda observed that 52.7% of respondents with PTSD also had a comorbid MDD (7). Many other authors have reported a positive association between MDD and PTSD (3, 4, 40, 41).

CONCLUSIONS AND RECOMMENDATIONS

In keeping with other studies, we found a considerable burden of PTSD among attendees of HIV clinics in post-conflict Gulu district. PTSD in this clinic was associated with both war

trauma experiences and negative life events in a dose-response manner. PTSD had a tendency for comorbidity with major depressive disorder.

There is need to include trauma treatment services including treatment of PTSD in the treatment programmes of HIV care services in communities facing conflict or emerging from conflict. Given the dose-response relationship between the number of war trauma experiences and number of negative life events on one hand and PTSD on the other, these two variables could be included in a screening instrument for PTSD in conflict and post-conflict settings. Lastly any trauma treatment that includes PTSD management should consider including the management of major depressive disorder due to the tendency for comorbidity between these two disorders.

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